

REMARKS

In an Office Action date January, 26, 2009, Claims 1-16 of the present application were rejected. Herein, Claims 1, 3-15 are amended and Claim 2 has been cancelled. No new matter has been added. Claims 1 and 3-16 are believed to be allowable over the prior art of record. Further examination and reconsideration of the application is respectfully requested.

Minor amendments to the specification have been made to correct various editorial and idiomatic errors. No new matter has been added.

Claim 1 was rejected under 35 U.S.C. 103(a) as being unpatentable over Ma et al (U.S. Patent Application No. 2003/0072255 A1, hereafter "Ma") in view of the background of the Applicant's specification (hereafter "Background").

Claim 1 recites, in part, generating propagation coefficient estimation symbols that are orthogonal to each other between each of the transmission antennas. Ma and the Background fail to disclose or suggest this feature of Claim 1.

The Background discloses generating a propagation coefficient estimation symbol, Sref, for the transmission antennas (Specification [0006] and Fig.18, item 901]. Thus, a single symbol, Sref, is used for the transmission antennas.

Contrast this to the present invention as claimed in Claim 1, wherein orthogonal propagation coefficient estimation symbols are generated between the respective transmission antennas, i.e. multiple propagation coefficient estimation symbols are generated between each of the transmission antennas (Specification [0045], multiple orthogonal symbols Sref1 and Sref2 are generated for TX1 and TX2 respectively). Thus, neither Ma nor the Background disclose or suggest generating propagation coefficient estimation symbols which are orthogonal to each other between each of the transmission antennas.

Based upon the amended limitations and the above remarks, the Applicant believes Claim 1

is patentable over any combination of Ma and the Background.

Further, Claims 3-5 are patentable over any combination of Ma and the Background based at least on their dependency from allowable Claim 1.

Additionally, Claim 4 recites, in part, a known phase and amplitude are assigned as the pilot carrier to only one of data symbols to be simultaneously transmitted from the plurality of transmission antennas, and an amplitude of 0 is assigned as the pilot carrier to the other data symbols to be simultaneously transmitted. Ma, the Background, and Dubuc fail to disclose or suggest this feature of Claim 4.

Dubuc discloses at a first transmission time, the transmission of a first pilot carrier with a predetermined amplitude and phase (Fig.7, Item 701) and then at a second transmission time, the transmission of a second pilot carrier having zero amplitude (Fig.7, Item 702 illustrated as a gap).

Thus, because the dual pilot carriers are transmitted at two separate times, Dubuc does not disclose nor suggest a known phase and amplitude are assigned as the pilot carrier to only one of data symbols to be simultaneously transmitted from the plurality of transmission antennas, and an amplitude of 0 is assigned as the pilot carrier to the other data symbols to be simultaneously transmitted.

Based upon the amended limitations and the above remarks, the Applicant believes Claim 4 is patentable over any combination of Ma, the Background, and Dubuc.

Claim 6 recites, in part, estimating characteristics possessed by a plurality of transfer paths between the transmission antennas and the receptions antennas, for each of the transfer paths. Ma and the Background fail to disclose this feature of Claim 6.

The conventional transfer apparatus disclosed in the Background is limited to estimating the frequency error based on the same synchronization preambles transmitted from a plurality of

antennas, thus, while a frequency error can be estimated for each reception antenna, a frequency cannot be estimated for each transfer path (Specification [0012]). Thus, neither Ma nor the Background disclose or suggest estimating characteristics possessed by a plurality of transfer paths between the transmission antennas and the receptions antennas, for each of the transfer paths.

Based upon the amended limitations and the above remarks, the Applicant believes Claim 6 is patentable over any combination of Ma and the Background.

Further, Claims 7-14 are patentable over any combination of Ma and the Background based at least on their dependency from allowable Claim 6.

Additionally, Claim 8 recites, in part, calculating a frequency correction value for correcting the received signal, for each of the reception antennas, by weighted-averaging the estimated frequency error occurring in each of the transfer paths. Ma and the Background fail to disclose this feature of Claim 8.

While the Background discloses correcting a frequency of the received signal based on the frequency error average by the averaging section, the Background does not disclose weighted-averaging the estimated frequency error. Thus, the Background does not disclose nor suggest calculating a frequency correction value for correcting the received signal, for each of the reception antennas, by weighted-averaging the estimated frequency error occurring in each of the transfer paths.

Based upon the amended limitations and the above remarks, the Applicant believes Claim 8 is patentable over any combination of Ma and the Background.

Independent Claim 15 is directed to a data transmission apparatus reciting limitations substantially similar to the limitations of the data transmission method as claimed in Claim 1. For at least the reasons discussed above between the present application and the Background, independent Claim 15 is patentable over any combination of Ma and the Background.

Independent Claim 16 is directed to a reception apparatus reciting limitations substantially similar to the limitations of the data reception method as claimed in Claim 6. For at least the reasons discussed above between the present application and the Background, independent Claim 16 is patentable any combination of Ma and the Background.

Therefore, for at least the reasons presented above, it is submitted that the independent Claims 1, 6, 15, and 16, as well as the claims depending therefrom, are clearly allowable over the prior art of record.

In view of the foregoing amendments and remarks, it is respectfully submitted that the present application is clearly in condition for allowance. An early notice thereof is earnestly solicited.

If, after reviewing this Amendment, the Examiner feels there are any issues remaining which must be resolved before the application can be passed to issue, it is respectfully requested that the Examiner contact the undersigned by telephone in order to resolve such issues.

Respectfully submitted,

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